

B. Amendment to the Claims

Please amend claims 1, 6, 7, 9, 11, 12, 14, 15 and 17 as follows. A listing of all claims in the application is provided.

1. (Currently Amended) A chemical sensor for detecting a reaction of a sensor material with a specimen on the basis of an intensity of a surface plasmon polariton wave propagated along a surface of a sensor medium comprising the sensor material, said chemical sensor comprising the sensor medium,

wherein said sensor medium comprises a periodic structure and the sensor material disposed on the periodic structure, the periodic structure having a pitch substantially equal to an integral multiple of a wavelength of the surface ~~plasma~~ plasmon polariton wave generated by irradiating an interface between the periodic structure and the sensor material with light.

2. (Original) A sensor according to Claim 1, wherein the sensor material is a biochemical sensor material.

3. (Original) A sensor according to Claim 1, wherein the periodic structure comprises a plurality of openings provided in a metal film with a predetermined pitch, the openings having a size smaller than a wavelength of the irradiation light.

4. (Original) A sensor according to Claim 3, wherein the openings have a substantially circular shape or a substantially polygonal shape, and their periodic arrangement is a two-dimensional arrangement in the metal film surface.

5. (Original) A sensor according to Claim 3, wherein the openings have a slit shape, and their periodic arrangement is a one-dimensional arrangement in the metal film surface.

6. (Currently Amended) A sensor according to Claim 5, wherein the openings ~~having a slit-like shape includes~~ include adjacent two openings sandwiching a metal film portion having a length of circumference, which is a substantially integral multiple of a wavelength of the surface plasmon polariton wave.

7. (Currently Amended) A sensor according to Claim 3, wherein the periodic structure ~~comprising a plurality of openings provided in a metal film with a predetermined pitch~~ is provided in a plurality of periodic structures, which have the same or different sizes and/or pitches of their openings and the same or different arrangement directions.

8. (Original) A sensor according to Claim 1, wherein the periodic structure comprises at least one opening provided in a metal film with a predetermined pitch and at least one recess portion or projection portion provided in the metal film, the opening having a size which is smaller than a wavelength of the irradiation light.

9. (Currently Amended) A sensor according to Claim 8, wherein the opening and the recess portion or the projection portion ~~[[has]]~~ have a substantially circular

shape or a substantially polygonal shape, and their periodic arrangements are a two-dimensional arrangement.

10. (Original) A sensor according to Claim 9, wherein the two-dimensional arrangement is such an arrangement that the recess portion or the projection portion is disposed concentrically around the opening.

11. (Currently Amended) A sensor according to Claim 8, wherein the opening and the recess portion or the projection portion ~~has a slit-like~~ have a slit shape, and their periodic arrangements are a one-dimensional arrangement.

12. (Currently Amended) A sensor according to Claim 8, wherein the opening includes adjacent two openings sandwiching a metal film portion having a length of circumference which is a substantially integral multiple of ~~[[a]]~~ the wavelength of the surface plasmon polariton wave.

13. (Original) A sensor according to Claim 3, wherein the metal film is a film of a metal or alloy selected from the group consisting of gold, silver, copper, and aluminum.

14. (Currently Amended) A sensor according to Claim 1, wherein the periodic structure comprises fine metal particles disposed on a substrate with a

predetermined pitch, the fine metal particles having a size which is smaller than ~~[[a]]~~ the wavelength of the surface plasmon polariton wave.

15. (Currently Amended) A sensor according to Claim 14, wherein the fine metal particles have a length of circumference which is a substantially integral multiple of ~~[[a]]~~ the wavelength of the surface plasmon polariton wave.

16. (Original) A sensor according to Claim 1, wherein the sensor medium comprises the periodic structure and a substrate for the sensor material disposed on the periodic structure, the substrate comprising a prism.

17. (Currently Amended) A sensor apparatus, comprising:
a chemical sensor according to ~~any one of Claims 1-16~~ Claim 1,
a light source for irradiating the chemical sensor with light, and
a photodetector for detecting light transmitted through or reflected from the chemical sensor.

18. (Original) An apparatus according to Claim 17, wherein the photodetector comprises a spectroscope.

19. (Original) An apparatus according to Claim 18, wherein the photodetector comprises means for detecting light transmitted through a band-pass filter.

20. (Original) An apparatus according to Claim 17, wherein the sensor medium is integrally supported in a micro total analysis system prepared through a semiconductor process.

21. (Original) An apparatus according to Claim 17, wherein the sensor medium is integrally supported in a DNA chip prepared through a semiconductor process.

22. (Original) An apparatus according to Claim 17, wherein the sensor medium is integrally supported in a protein chip prepared through a semiconductor process.